

AD-A109 655 NAVY PERSONNEL RESEARCH AND DEVELOPMENT CENTER SAN D--ETC F/G 13/1
ENERGY-RELATED ATTITUDES OF NAVY FAMILY HOUSING RESIDENTS.(U)
DEC 81 D F LITTLE, K I MCCABE, S MILLS

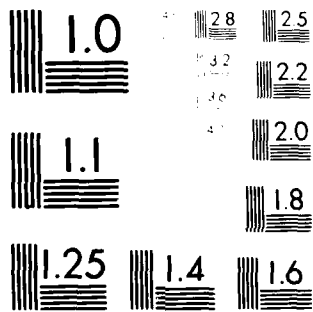
UNCLASSIFIED NPRDC-TR-82-20

NL

1 OF 1
AD-A
109 655



END
DATE
FILMED
02-82
DTIC



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

AD A 169855

12

December 1981

**ENERGY-RELATED ATTITUDES OF NAVY FAMILY
HOUSING RESIDENTS**

David F. Little
Kevin I. McCabe
Shelley Mills
Bela Feher
E. P. Somer

Reviewed by
Robert Penn

COPIES
SELECTED
JAN 15 1982

Released by
James F. Kelly, Jr.
Commanding Officer

Navy Personnel Research and Development Center
San Diego, California 92152

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER NPRDC TR 82-20	2. GOVT ACCESSION NO. AD A109 655	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) ENERGY-RELATED ATTITUDES OF NAVY FAMILY HOUSING RESIDENTS		5. TYPE OF REPORT & PERIOD COVERED Second Report Mar 1979-May 1979
7. AUTHOR(s) David F. Little, Kevin I. McCabe, Shelley Mills, Bela Feher, E. P. Somer		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS Navy Personnel Research and Development Center San Diego, California 92152		8. CONTRACT OR GRANT NUMBER(s)
11. CONTROLLING OFFICE NAME AND ADDRESS Navy Personnel Research and Development Center San Diego, California 92152		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS Reimbursable
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE December 1981
		13. NUMBER OF PAGES 44
		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Energy Conservation Attitudes Family Housing Information		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The purpose of the study was to assess the energy-related attitudes, opinions, and practices of Navy family housing residents. Residents of five family housing installations located throughout the United States were surveyed. Emphasis was directed toward the evaluation of energy-related attitudes, housing problems, variables affecting conservation, and energy consumption practices. Residents' attitudes were generally of a proconservation nature, although substantial discrepancies were evident. Residents saw		

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

✓ conservation information as most promotive of conservation; and the lack of information about energy costs and consumption and the structural soundness of the housing, as the greatest hindrances to conservation. Most residents reported they performed both one-time and recurring conservation-oriented practices. However, considerable room remains for increasing performance rates of both kinds of practices. Recommendations included implementing an educational program aimed at forming proconservation attitudes and conveying information about energy-efficient practices, utility consumption, and costs. Structural maintenance and modifications should be integrated with educational efforts.

17

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

FOREWORD

This study was conducted as part of a continuing program of research and development under the sponsorship of the Naval Facilities Engineering Command. The objective of this program is to provide Navy management with information regarding energy policies and programs that would foster conservation by military housing residents.

This report is the third in a series concerning the study of conservation. Previous reports described the conservation-related attitudes and practices of Navy family housing residents and an evaluation of a conservation program for master-metered housing sites (NPRDC SR 79-23 and TR 82-18). The purpose of the present study was to perform a more in-depth analysis of the energy-related attitudes, opinions, and self-reported practices of Navy family housing residents. Results will be used in the formulation and development of future conservation policies and programs.

JAMES F. KELLY, JR.
Commanding Officer

JAMES J. REGAN
Technical Director

Accession For	
NTIS	<input checked="checked" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Avail and/or	
Special	
A	

SUMMARY

Problem

The Department of Defense has been examining policies governing the use of energy in military family housing and seeking policies and procedures that would foster conservation by housing residents. If newly adopted energy-conserving practices are to have a long-term effect, residents' energy-related attitudes must be brought into a consistent relationship with their energy conserving behaviors. The nature of family housing residents' attitudes toward energy conservation is not well known at this time.

Purpose

The objective of this effort was to assess the energy-related attitudes, opinions, and practices of Navy family housing residents. Information obtained will be used by Navy management for the formulation and development of future conservation policies and programs.

Approach

Residents of five Navy family housing installations were selected to participate in the study. Participants were administered a questionnaire consisting of 116 items covering eight general areas. Responses to items concerning energy-related attitudes, housing problems, system variables affecting conservation, and energy-consumption practices were analyzed.

Results and Discussion

1. General attitudes. From a factor analysis performed on the attitude items, six factors emerged: (a) personal impact, (b) importance of comfort, (c) conservation image, (d) reality of energy shortage, (e) willingness to pay for utilities, and (f) profiteering by energy suppliers. Participants' responses to the attitude items generally were of a proconservation nature, although substantial variations were evident among respondents. The first four factors are key domains for emphasis in educational programs.

2. Housing problems. Analysis of the items concerning energy-related housing problems indicated that the energy efficiency of many houses was compromised. The most frequently reported problems were poor sealing of doors and windows, inadequate insulation, and poor placement of thermostats and vents.

3. System variables affecting conservation. Sufficient conservation information was seen as most important in promoting energy conservation. The lack of information about energy cost and consumption, along with the construction and maintenance of the housing, were seen as the greatest hindrances to household energy conservation. An effective conservation program must satisfy these needs of conservation-conscious residents in order to obtain maximum results.

4. Consumption practices. While residents typically reported that they engaged in energy-conserving practices, a smaller but significant percentage did not. For example, nearly a third of the residents reported that they did not follow recommended thermostat guidelines for space heating.

PRECEDING PAGE BLANK-NOT FILLED

Conclusion and Recommendations

1. From these results, it is apparent that an energy conservation program would best be of an informational nature, emphasizing formation of proconservation attitudes and providing information regarding energy-efficient practices, utility consumption, and costs. Structural maintenance and modifications should be combined with such efforts, demonstrating that the Navy is working with the residents to reduce energy consumption.

2. Frequently repeated conservation practices should be treated differently than one-time conservation actions in any educational program. Repetitious practices should be maintained by continuing external supports until they become self-sustaining through internal supports.

3. To increase energy conservation practices, Navy management policies should include:

a. Implementing a comprehensive educational program directed toward energy conservation.

b. Providing residents with feedback concerning utility consumption and costs.

c. Making energy-conserving structural modifications to residences.

d. Providing rapid response to energy-related maintenance requests.

CONTENTS

	Page
INTRODUCTION	1
Problem	1
Background	1
Purpose	1
APPROACH	2
Questionnaire Composition	2
Questionnaire Administration	2
Analyses	2
RESULTS	2
Demographic and Background Characteristics	2
General Energy-related Attitudes	3
Energy-related Housing Problems	5
System Variables Affecting Energy Conservation	6
Energy Consumption Practices	6
DISCUSSION	15
General Attitudes	15
System Variables Affecting Conservation	15
CONCLUSIONS	17
RECOMMENDATIONS	17
REFERENCES	19
APPENDIX A--SURVEY QUESTIONNAIRE	A-0
APPENDIX B--RESPONSE DATA TO QUESTIONNAIRE SECTIONS NOT DISCUSSED	B-0
DISTRIBUTION LIST	

LIST OF TABLES

	Page
1. Summary of Factor Analysis of Attitude Items	7
2. Responses to Energy-Related Attitude Items	9
3. Percentage of Respondents Reporting Energy-Related Housing Problems	12
4. System Variables Affecting Household Energy Conservation.	13
5. Self-Reported Energy Conservation Practices	14

INTRODUCTION

Problem

The Department of Defense has been examining current policies that govern the use of energy in military family housing and seeking policies and methods that would foster energy conservation by residents. Among the methods under investigation are various behavioral strategies designed to reduce consumption.

From a behavioral perspective, energy conservation requires that energy consumption practices be modified to make them more energy-efficient. Although many studies have demonstrated the applicability of behavioral techniques in the modification of energy-consumption practices (e.g., Becker, 1978; Socolow, 1978), several researchers believe that long-term change requires the concurrent modification of energy-related attitudes (e.g., Darley, Seligman, & Becker, 1979; Stern & Kirkpatrick, 1977). In developing an effective Navy housing energy conservation program, policy-makers and program planners should assess the attitudes of housing residents to determine areas of attitudinal consistencies and inconsistencies with respect to energy conservation.

Background

Previous studies have examined the viability of applying behavioral strategies to the modification of energy consumption practices. Although the results of such studies generally have been successful in temporarily reducing energy consumption, problems with long-term applications are evident. One problem is the potential tendency of incentives, both rewards and punishments, to decrease in effectiveness over time. After the initial effect on behavior, incentives may lose their impact when individuals adapt or "get used to" their effects. Yergin (1979) has described this occurrence in West Germany's attempts to control gasoline consumption. An initial rise in the cost of gasoline resulted in a 3-month decrease in consumption, followed by an increase to previous consumption levels. As this example illustrates, without a corresponding change in energy-related attitudes, incentives may lack long-term influence.

An alternative to the continued use of incentives as a means of sustaining reduced energy consumption is the modification of energy-related attitudes. The assumption is that the development of energy-conserving attitudes would have a more permanent influence on consumption than would the use of incentives. The relationship between energy-related attitudes and consumption has been investigated by several researchers. White, Magnusson, and Somer (1979) administered a survey to residents of Navy housing throughout the United States. Survey questions concerned residents' demographic characteristics, attitudes, and reported consumption practices. Significant correlations were found between residents' energy-related attitudes and their self-reported practices. Similar evidence has been found by Seligman, Kriss, Darley, Fazio, Becker, and Pryor (1979), who examined the relationship between attitudes and consumption of nonmilitary home owners. They found that attitudes accounted for over 50 percent of the variance in utility consumption. The results of these studies support the importance of the relationship between residents' energy-related attitudes and their energy consumption, and emphasize the necessity of considering attitudes in accomplishing long-term behavioral change.

Purpose

The objective of this effort was to assess the energy-related attitudes, opinions, and practices of Navy family housing residents. Information obtained will be used to direct the formulation and development of future conservation policies and programs.

APPROACH

Questionnaire Composition

A survey questionnaire was developed to assess the energy-related attitudes and practices of Navy family housing residents. A copy of the questionnaire is provided in Appendix A.

The questionnaire consisted of 116 items covering eight general areas: (1) demographic/background characteristics, (2) general energy-related attitudes, (3) family economic characteristics, (4) energy-related housing problems, (5) system variables affecting energy conservation, (6) attitudes toward energy crisis transportation alternatives, (7) energy consumption practices, and (8) inventory of major household appliances.

Questionnaire Administration

A total of 1315 residents of the following five Navy family housing installations were selected to participate in the study: (1) Point Mugu, California (N = 120), (2) Port Hueneme, California (N = 120), (3) Great Lakes, Illinois (N = 480), (4) Whidbey Island, Washington (N = 370), and (5) Fallon, Nevada (N = 225). Participants were mailed a copy of the questionnaire, along with a postpaid return envelope and a cover letter signed by the Assistant Commander for Family Housing, Naval Facilities Engineering Command. The letter explained the purpose of the questionnaire and assured the confidentiality of responses. Prompt return was requested. All questionnaires were mailed in March 1979. By 1 May 1979, the response cut-off date, 786 (60%) usable questionnaires had been returned.

Analyses

Survey responses to items in the following five areas were analyzed: (1) demographic and background characteristics, (2) general energy-related attitudes, (3) energy-related housing problems, (4) system variables affecting energy conservation, and (5) energy consumption practices. Those concerning energy-related attitudes (2 above) were factor analyzed using the Statistical Package for the Social Sciences (SPSS) (Nie, Hull, Jenkins, & Steinbrenner, 1975) principal factors procedure. This procedure uses an iterative approach and was selected because of its reputation for deriving clear factor solutions.

Responses to items concerning (1) family economic characteristics, (2) attitudes toward energy crisis transportation variables, and (3) major household appliances are not discussed herein but are provided for information in Appendix B.

RESULTS

Demographic and Background Characteristics

Questions 1 through 22 examined family housing demographics, background information, and residents' satisfaction with Navy housing.

1. Service Members. Nearly all (97%) of the service members were males. Over half were between 31 and 40 years of age and almost two-thirds (63%) were in pay grades E-5 through E-7. Ninety-six percent of the service members had completed at least a high school education.

2. Service Members' Spouses. Service members' spouses tended to be of the same age group and educational level as the service members. Forty-four percent of the spouses were in the 31-to-40-year age range and 84 percent had completed at least a high school education.

3. Households. Over half of the respondents (54%) had lived in their present homes for over a year. Households consisted of a median of four persons. Thirty-nine percent of the children were five years of age or under, 40 percent were between 6 and 12 years, and 21 percent were between 13 and 18 years. When asked how many days per week the house is occupied for most of the day, nearly half (44%) of the respondents reported 7 days.

4. Income and Lifestyle. Over half (54%) of the respondents reported a total family income of \$13,000 or greater per year. Eight percent of the respondents described their present lifestyle as being one in which they can't afford some of the things they need; 23 percent, as one in which they have to budget carefully; and 68 percent, as at least comfortable. Respondents reported similar although slightly less comfortable lifestyles while growing up. Twenty percent reported their childhood lifestyles as insufficient in fulfilling their basic needs; 25 percent, as one in which they had to budget carefully, and 55, as having been comfortable or better.

5. Navy Housing. Over two thirds of the residents described themselves as being either very satisfied (38%) or somewhat satisfied (34%) with Navy housing. Twenty percent reported being either somewhat dissatisfied (14%) or very dissatisfied (6%). Eight percent had no opinion.

6. Energy Conservation. When asked who accounts for household energy conservation, the majority of respondents (60%) believed that conservation was practiced by nearly everyone in the family. An additional 18 percent believed that the service member's spouse accounted for most of the conservation, and 13 percent considered the service member to be the primary conservor.

General Energy-related Attitudes

Respondents answered items assessing attitudes toward energy consumption and conservation (items 23 through 46) using a 6-point scale: (1) strongly agree, (2) agree, (3) neither agree nor disagree, (4) disagree, (5) strongly disagree, and (6) no opinion. In analyzing responses to these items, only data for subjects who responded to at least 85 percent of the items were included in subsequent analyses; no opinion responses were scored as missing data. This resulted in individual item samples ranging from 656 to 709 respondents.

The factor analysis performed on these items extracted an initial solution consisting of eight factors with eigenvalues of 1.0 or greater, accounting for 58.7 percent of the total variance. Factor solutions extracting from five to eight factors were examined and a varimax rotation was performed on each to simplify the within-factor loadings. From the alternative solutions, a six-factor extraction was selected as being most clearly interpretable. This solution resulted in latent roots ranging from 1.89 to .78, with five of the six factors having latent roots greater than 1.0. These six factors, which accounted for 36 percent of the total variance, were (1) personal impact, (2) importance of comfort,

(3) conservation image, (4) reality of energy shortage, (5) willingness to pay for utilities, and (6) profiteering by energy suppliers.

Variables with loadings of .30 or greater on the rotated factor matrix were included in the interpretation. This resulted in complexities of one for 18 of the variables. Of the six remaining items, four had complexities of two, and two failed to load on any factor. Table 1 presents the six factors and their component items; and Table 2, the responses of residents broken down by percent.¹ The six factors are described in the following paragraphs.

1. Personal Impact. Eight items loaded substantially on the first factor. These items were primarily concerned with the impact of energy conservation in the home on the overall energy situation. Sixty percent of the respondents viewed household conservation as potentially having a positive effect on the energy problem, and 55 percent believed there would be enough energy if everyone quit wasting it. Although nearly a third of the respondents (31%) felt that wasteful consumption in the home was largely responsible for the energy problem, many disagreed as to the importance of conservation in the home. Twenty-four percent believed that household conservation could not ease energy problems; 28 percent, that there would still not be enough energy even if everyone quit wasting, and 57 percent, that waste in the home was not responsible for the present energy situation.

2. Importance of Comfort. Five items dealt with the importance of comfort and the effort that would be required to conserve energy. Two-thirds of the respondents believed that saving energy was more important than personal comfort, and over half reported they would be willing to reduce their heating to below a comfortable level. Over three fourths (77%) reported that the amount of energy that can be saved is worth the effort and discomfort required.

Although the comfort-oriented attitudes of the majority of respondents were consistent with energy conservation, the results were not entirely encouraging. For instance, 15 percent of the respondents believed that the amount of energy saved is not worth their effort, and 14 percent placed their personal comfort before conservation in importance. Moreover, one-third of the residents opposed reducing their heating thermostats to below a comfortable level and an additional 18 percent reported that they would increase their heater setting rather than wear a sweater.

3. Conservation Image. The four items loading on this factor concerned respondents' views of themselves and their families with regards to energy conservation. The vast majority of respondents saw both themselves and their families as being energy conservers (85% and 94% respectively). In addition, 77 percent considered themselves to be well informed about household conservation, with most (85%) believing they would practice conservation regardless of whether or not they had to pay for their utilities. Eleven percent reported that they were deficient in their knowledge of household conservation and an equal percentage was unsure of the extent of their information.

4. Reality of Energy Shortage. The fourth factor consisted of five items concerned with the reality of the energy shortage and with possible solutions to the problem. Although nearly half of the residents (49%) believed in the reality of the energy shortage, 31 percent did not. Sixty percent believed that the shortage was a long-term problem, and 27 percent did not. There were mixed feelings as to whether or not technology would

¹Because of the large number of tables in this section relative to the amount of text, the tables are placed at the end of the section, commencing on page 7.

provide the solution, with 31 percent agreeing, 36 percent disagreeing, and 33 percent neither agreeing nor disagreeing. Nearly two-thirds of the respondents (65%) believed that the use of efficient appliances would solve the energy situation.

5. Willingness to Pay for Utilities. Two items concerned the willingness of respondents to pay for their utilities rather than reduce their energy consumption. Nearly three quarters of the respondents (72%) reported that they would rather reduce their energy consumption than pay for it. However, 17 percent indicated that they would be willing to pay.

6. Profiteering by Energy Suppliers. This final factor consisted of two items dealing with possible causes for the present energy problem. These items included manipulations by foreign producers and profiteering by domestic energy companies. Although over half of the respondents (54%) believed that foreign oil manipulation was responsible, a far greater proportion (70%) believed profiteering by oil and electric companies to be the cause.

As shown in Tables 1 and 2, two attitude items did not have loadings of .30 or greater on any of the factors. The first concerned whether or not too much dependence on oil caused the present energy situation. Over two-thirds of the respondents agreed that oil dependence was the cause, while 16 percent disagreed. The second considered the extent to which respondents were willing to pay for use of excess energy if they were rewarded for conserving. The majority of respondents (58%) agreed with the idea of using incentives to reduce energy consumption, 23 percent disagreed, and 19 percent neither agreed nor disagreed.

Energy-related Housing Problems

Items 55 through 65 concerned problems that respondents believed led to the waste of energy in their own home. For discussion purposes, these items have been divided into four areas: (1) exterior air leaks, (2) heating, (3) insulation, and (4) additional problems. Table 3 presents the percent of respondents that believed that these problems existed in their housing.

1. Exterior Air Leaks. Three items dealt with cracks and poor seals between the interior and exterior walls of the house that might increase the amount of heating and cooling required to maintain a comfortable indoor climate. Over two-thirds of the respondents (69%) reported windows and doors that failed to close tightly; nearly a third (31%), cracks in their floors, walls, and ceilings; and 16%, cracked or broken windows.

2. Heating. Three items were concerned with thermostat adjustability and thermostat and vent location. Nearly half of the respondents (48%) reported that their heating vents were poorly placed; and almost a third (32%) that their thermostats were poorly located. Seventeen percent reported that their thermostats were not adjustable.

3. Insulation. Two items concerned the presence of drapes, shades, or curtains and adequate structural insulation. Sixty-two percent of the residents reported that their housing was not adequately insulated; and several (15%), that drapes, shades, or curtains were missing.

4. Additional Problems. Finally, two items concerned problems with poorly sealed refrigerator or oven doors and leaky hot water faucets. Nearly one quarter of the respondents (23%) reported poorly sealed refrigerator or oven doors; and 24 percent, leaky hot water faucets.

System Variables Affecting Energy Conservation

In this section (items 66-74), respondents were presented with a list of system variables and asked to indicate, on a four-point scale, how each affected energy conservation in Navy family housing. Responses are provided in Table 4. For discussion, these system variables were organized into three categories: (1) housing structure and appliances, (2) conservation information, and (3) feedback and incentives.

1. Housing Structure and Appliances. As shown, well over half of the respondents (59%) believed that the construction of their housing hindered energy conservation; 27 percent, that it had no known effect; and 14 percent, that it had a positive affect. Twenty percent of the residents believed that their furnished appliances were a problem; over half (54%) that they had no known effect; and 26 percent, that they promoted conservation.

2. Conservation Information. Nearly two-thirds of the respondents (65%) believed that media information promoted conservation; 33 percent maintained a neutral position, and 3 percent felt such information was a hindrance. Almost half of the residents (49%) believed that their past experience with civilian housing promoted conservation; 7 percent, that it had a detrimental effect; and 43 percent, either that it had no effect or they didn't know its effect. Few considered that other residents' opinions toward energy conservation had a significant impact on their own energy-related behaviors. Less than one-fifth (18%) believed that such opinions served to promote conservation; 11 percent believed that they were a hindrance to conservation; and the remaining 70 percent held a neutral position. Finally, nearly half of the respondents (49%) viewed housing office information programs as promoting conservation, 4 percent saw them as detrimental, and the remaining 47 percent believed that they had no known effect.

3. Feedback and Incentives. Over half of the respondents (52%) believed the lack of feedback information hindered conservation, 39 percent held a neutral position, and 9 percent considered a lack of information to be beneficial. Twenty percent of the respondents believed that furnished utilities served to promote conservation; another 20 percent, that they were a hindrance; and 60 percent, either that they had either no effect or that they didn't know the effect.

Energy Consumption Practices

Items 87 through 108 concerned residents' self-reported household energy-related practices. For 18 of these items (Nos. 87-104), respondents indicated how often each practice occurred in their home. Table 5 provides results, organized into six categories: (1) bathroom, (2) heating, (3) kitchen, (4) laundry, (5) lighting, and (6) reminders to the family. No single practice or household domain was prominent as a problem area, but some room for improvement apparently exists in each area.

The last four items in this group (Nos. 105-108) concerned one-time actions that respondents may have performed in an effort to reduce their energy consumption. Actions included altering temperature settings of water heaters and refrigerators, the installation of weather stripping, and the replacement of light bulbs with those of lower wattage. The majority of respondents (70%) reported that they have switched to lower wattage bulbs. Although 42 percent of the residents reported that they had decreased the temperature setting of their water heaters, 46 percent had not. Similarly, over half of the respondents had increased their refrigerators' temperature setting, while 42 percent had not. Finally, only 18 percent of the respondents reported that they had installed weather stripping on their windows and doors.

Table I
Summary of Factor Analysis of Attitude Items

Factor/Component Items ^a	Factor Loading					
	I	II	III	IV	V	VI
I. Personal Impact						
The present energy situation could be eased through energy conservation in the home. (32)	<u>.57</u>	.21	.08	.25	.03	-.09
Wasteful use of energy in the home is to a large extent responsible for the present energy situation. (28)	<u>.50</u>	.09	-.02	.10	.06	-.11
There would be enough energy if everyone quit wasting it. (39)	<u>.49</u>	.10	.12	-.15	.06	-.05
If people knew more about the energy situation they would conserve more. (23)	<u>.38</u>	.13	.05	.11	-.01	-.02
I would reduce my energy consumption rather than have to pay for it. (29)	<u>.36</u>	.09	.05	.12	.92	.03
We should change our way of life in this country so that we can live with the present energy situation. (24)	<u>.36</u>	.24	.00	.29	.01	.10
People should put on sweaters to stay warm before they raise their heater thermostat settings. (35)	<u>.35</u>	.39	.19	.18	.06	.06
Regardless of the cause, we are facing a long-term energy shortage. (26)	<u>.35</u>	.12	.02	.60	.00	-.02
II. Importance of Comfort						
My own personal comfort is worth more to me than saving heating fuel or electricity. (45)	-.14	<u>-.64</u>	-.11	-.17	-.10	-.01
I would not reduce my heating thermostat below the setting I find comfortable. (33)	-.18	<u>-.58</u>	-.04	-.11	-.09	-.08
The amount of energy a residential consumer could save isn't worth the effort and discomfort required to save it. (27)	-.17	<u>-.50</u>	-.07	-.15	-.09	-.07
People should put on sweaters to stay warm before they raise their heater thermostat settings. (35)	.35	<u>.39</u>	.19	.18	.06	.06
I would be willing to reduce my energy consumption only if it cost me something not to. (38)	.17	<u>-.35</u>	-.21	-.08	.08	-.04
III. Conservation Image						
I think of myself as an energy conserver. (37)	.17	.12	<u>.76</u>	-.02	.10	.02
In my family, I think we generally try to conserve energy. (30)	.12	.03	<u>.65</u>	-.07	.11	-.08
I would conserve energy regardless of whether I had to pay for it or not. (42)	.08	.25	<u>.52</u>	.06	.00	-.06
I think I am well informed about household energy conservation. (46)	-.03	.02	<u>.46</u>	-.07	-.01	.06

^aThe numbers in parentheses refer to questionnaire item numbers.

Table I (Continued)

Factor/Component Items ^a	Factor Loading					
	I	II	III	IV	V	VI
IV. Reality of Energy Shortage						
Regardless of the cause, we are facing a long-term energy shortage. (26)	.35	.12	.02	<u>.60</u>	.00	-.02
There is no real shortage of energy. (41)	-.23	-.15	.03	<u>-.60</u>	.04	.01
Technological discoveries will provide all the energy we need long before our present sources run out. (43)	-.03	-.26	.05	<u>-.51</u>	-.05	.03
Profiteering by oil and electric companies is largely responsible for the present energy situation. (40)	-.08	-.12	.02	<u>-.40</u>	.02	-.40
We will have sufficient energy if we develop and adopt more energy efficient devices and appliances. (44)	.20	-.01	.10	<u>-.36</u>	-.01	-.19
V. Willingness to Pay for Utilities						
I would reduce my energy consumption rather than have to pay for it. (29)	.36	.09	.05	.12	<u>.92</u>	.03
I would be willing to pay for part of my utilities rather than reduce my energy consumption. (25)	.13	-.19	-.16	.08	<u>-.33</u>	.07
VI. Profiteering by Energy Suppliers						
Foreign oil prices and restrictions are largely responsible for the present energy situation. (34)	.19	-.12	-.01	-.03	.03	<u>-.71</u>
Profiteering by oil and electric companies is largely responsible for the present energy situation. (40)	-.08	-.12	.02	-.40	.02	<u>-.40</u>
<hr/>						
Items with Factor Loading < .30						
Depending too much on oil as an energy source has caused the present energy situation. (31)	.25	-.01	.01	.06	-.05	-.12
I would be willing to pay for any excess energy I use only if I were paid for the energy that I conserve on other occasions. (36)	.20	-.02	-.01	.00	.04	.04

^aThe numbers in parentheses refer to questionnaire item numbers.

Table 2
Responses to Energy-Related Attitude Items

Factor/Component Items ^d	Percentage ^b			Mean ^c	S.D.
	Disagree	Neither Agree nor Disagree	Agree		
I. <u>Personal Impact</u>					
The present energy situation could be eased through energy conservation in the home. (32)	24.2	15.6	60.2	2.58	1.15
Wasteful use of energy in the home is to a large extent responsible for the present energy situation. (28)	57.1	11.5	31.4	3.49	1.33
There would be enough energy if everyone quit wasting it. (39)	27.7	17.3	55.0	2.58	1.26
If people knew more about the energy situation they would conserve more. (23)	23.3	11.6	65.1	2.43	1.18
I would reduce my energy consumption rather than have to pay for it. (29)	17.0	11.4	71.7	2.13	1.22
We should change our way of life in this country so that we can live with the present energy situation. (24)	16.7	11.6	71.8	2.19	1.17
People should put on sweaters to stay warm before they raise their heater thermostat settings. (35)	18.1	10.9	71.0	2.27	1.21
Regardless of the cause, we are facing a long-term energy shortage. (26)	27.1	13.2	59.7	2.48	1.36
II. <u>Importance of Comfort</u>					
My own personal comfort is worth more to me than saving heating fuel or electricity. (45)	67.2	18.9	13.9	2.78	1.05
I would not reduce my heating thermostat below the setting I find comfortable. (33)	54.1	12.8	33.1	2.26	1.34
The amount of energy a residential consumer could save isn't worth the effort and discomfort required to save it. (27)	77.4	8.0	14.6	3.10	1.17
People should put on sweaters to stay warm before they raise their heater thermostat settings. (35)	18.1	10.9	71.0	2.27	1.21
I would be willing to reduce my energy consumption only if it cost me something not to. (38)	63.1	22.7	14.2	3.86	1.17

^aNumbers in parentheses refer to questionnaire item numbers.

^bDisagree responses include "somewhat disagree" and "strongly disagree"; and agree responses, "strongly agree" and "somewhat agree."

^cBased on responses made on a 5-point scale where 1 = strongly agree and 5 = strongly disagree.

Table 2 (Continued)

Factor/Component Items ^a	Percentage ^b			Mean ^c	S.D.
	Disagree	Neither Agree nor Disagree	Agree		
III. <u>Conservation Image</u>					
I think of myself as an energy conserver. (37)	3.0	12.1	84.9	1.82	.77
In my family, I think we generally try to conserve energy. (30)	3.0	2.8	94.2	1.60	.72
I would conserve energy regardless of whether I had to pay for it or not. (42)	5.5	9.5	84.9	1.78	.92
I think I am well informed about household energy conservation. (46)	12.4	10.7	77.0	2.06	1.02
IV. <u>Reality of Energy Shortage</u>					
Regardless of the cause, we are facing a long-term energy shortage. (26)	27.1	13.2	59.7	2.48	1.36
There is no real shortage of energy. (41)	49.4	19.5	31.1	2.36	1.32
Technological discoveries will provide all the energy we need long before our present sources run out. (43)	36.1	32.8	31.1	2.10	1.13
Profiteering by oil and electric companies is largely responsible for the present energy situation. (40)	14.5	15.5	70.1	1.19	1.18
We will have sufficient energy if we develop and adopt more energy-efficient devices and appliances. (44)	15.4	19.6	65.1	2.32	1.06
V. <u>Willingness to Pay for Utilities</u>					
I would reduce my energy consumption rather than have to pay for it. (29)	17.0	11.4	71.7	2.13	1.22
I would be willing to pay for part of my utilities rather than reduce my energy consumption. (25)	78.7	10.2	11.1	3.25	1.10
VI. <u>Profiteering by Energy Suppliers</u>					
Foreign oil prices and restrictions are largely responsible for the present energy situation. (34)	32.8	13.4	53.9	1.73	1.39
Profiteering by oil and electric companies is largely responsible for the present energy situation. (40)	14.5	15.5	70.1	1.19	1.18

^aNumbers in parentheses refer to questionnaire item numbers.

^bDisagree responses include "somewhat disagree" and "strongly disagree"; and agree responses, "strongly agree" and "somewhat agree."

^cBased on responses made on a 5-point scale where 1 = strongly agree and 5 = strongly disagree.

Table 2 (Continued)

Factor/Component Items ^a	Percentage ^b			Mean ^c	S.D.
	Disagree	Neither Agree nor Disagree	Agree		
<u>Items with Factor Loading < .30</u>					
Depending too much on oil as an energy source has caused the present energy situation. (31)	16.0	17.9	66.0	2.20	1.21
I would be willing to pay for any excess energy I use only if I were paid for the energy that I conserve on other occasions. (36)	21.8	19.8	58.4	2.47	1.34

^aNumbers in parentheses refer to questionnaire item numbers.

^bDisagree responses include "somewhat disagree" and "strongly disagree"; and agree responses, "strongly agree" and "somewhat agree."

^cBased on responses made on a 5-point scale where 1 = strongly agree and 5 = strongly disagree.

Table 3
**Percentage of Respondents Reporting Energy-Related
Housing Problems**

Items	Not Present (%)	Present (%)
<u>Exterior Air Leaks</u>		
56. Windows or doors do not close tightly	30.8	69.2
58. Cracks in floors, walls, ceilings, etc.	68.9	31.1
63. Cracked or broken windows	84.4	15.6
<u>Heating</u>		
55. Thermostat not adjustable	83.3	16.7
57. Vents poorly placed	51.7	48.3
60. Thermostat poorly placed	67.7	32.3
<u>Insulation</u>		
62. Drapes, shades, or curtains missing	85.0	15.0
64. Inadequate insulation	37.7	62.3
<u>Additional Problems</u>		
59. Refrigerator or oven doors do not seal tight	76.6	23.4
61. Hot water faucets drip	76.1	23.9

Note. Based on responses of entire sample (N = 786).

Table 4
System Variables Affecting Household Energy Conservation

Items	Promotes (%)	Hinders (%)	No Effect/ Don't Know (%)
<u>Housing Structure and Appliances</u>			
71. Energy efficiency of furnished appliances	25.7	19.6	54.7
72. Housing construction	14.2	59.3	26.5
<u>Conservation Information</u>			
66. Other residents' opinions about conservation	18.2	11.3	70.5
67. Civilian housing experience	49.4	7.3	43.3
68. Conservation information through the media	64.8	2.5	32.7
70. Information programs initiated through the housing office	49.0	3.6	47.4
<u>Feedback and Incentives</u>			
69. Lack of information about cost and consumption	8.8	52.2	39.0
73. Furnished housing utilities	19.7	20.4	59.9

Note. Based on responses of entire sample (N = 786).

Table 5
Self-Reported Energy Conservation Practices

Items		Never/ Sometimes (%)	Half of the time (%)	Most times/ Always (%)
<u>Bathroom</u>				
94.	Shower or bathe in cooler water	63.4	10.1	26.5
95.	Take short showers	27.5	10.9	61.6
<u>Heating</u>				
89.	Keep thermostat at 68 degrees or lower	32.0	14.2	53.8
91.	Turn off heating vents in unused rooms	25.6	5.3	69.2
92.	Turn heating down or off when not home	17.0	3.6	79.4
97.	Turn down thermostat before going to bed	24.1	4.6	71.3
103.	Close draperies or shades when cold	11.9	5.5	82.6
<u>Kitchen</u>				
90.	Heat small items in oven or broiler	95.9	0.9	3.2
96.	Get all needed items out of refrigerator at once	42.2	15.7	42.1
98.	Preheat oven for foods such as roasts	62.3	7.1	30.6
99.	Run hot water to wash and rinse dishes	62.6	10.9	26.5
<u>Laundry</u>				
87.	Wash partially full loads	91.0	2.5	6.5
101.	Dry partially full loads	94.2	3.1	2.7
102.	Wash clothes in cold water	38.1	20.1	41.8
104.	Hang clothes outside to dry	61.8	7.4	30.8
<u>Lighting</u>				
88.	Have lights on with no one in room	94.3	3.8	1.9
100.	Reduce the number of lights burning at same time	14.2	7.8	78.1
<u>Remind Family</u>				
93.	Remind family members to conserve	21.3	7.9	70.9

Note. Based on responses of entire sample (N = 786).

DISCUSSION

The present research sought to examine and evaluate the energy-related attitudes, opinions, and practices of Navy housing residents. Previous studies have demonstrated the relationship between energy-related attitudes and energy-conserving practices. The objective of the present study was to determine which attitudes, opinions, and practices require the greatest attention in future energy conservation programs.

General Attitudes

The majority of respondents hold attitudes consistent with energy conservation. They see themselves as conservers, are willing to place conservation before comfort, and believe they can have an effect on the overall energy situation. If these attitudes are reflected in the practices of housing residents, then problem consumers who use excessive amounts of energy are, quite fortunately, relatively few in number. However, since many respondents do hold some attitudes that are contrary to conservation, their attitudes must also be considered. In addition, some caution should be exercised in interpreting the results. Although 60 percent of the surveys were returned, it is quite possible that those residents least concerned with conservation were less likely to have completed the questionnaire. Similarly, residents may have reported attitudes and practices that they considered socially acceptable. As a result, the magnitude of apparent proconservation attitudes may be overestimated.

The results of the factor analysis may provide some direction for future conservation programs. Focus might be directed toward the following key areas:

1. Personal Impact. The extent to which personal conservation can affect the overall energy situation should be demonstrated. Many residents believed that their actions were of little significance in decreasing energy consumption.

2. Importance of Comfort. Residents need to be shown means of maintaining comfort while conserving energy. Residents often believed conservation would require discomfort and saw comfort as more important than conservation. Further, they believed that conservation required too much effort.

3. Reality of Energy Shortage. The reality of the energy shortage must be clarified. Residents need to believe that the present energy problems are more than the product of manipulations by energy suppliers.

4. Willingness to Pay for Utilities. Most residents would prefer not paying for their utility bills. Residents must realize that, if energy conservation efforts fail, they may have to pay for the energy they consume.

System Variables Affecting Conservation

Conservation-related information, including that derived from such sources as civilian housing experience, housing office programs, and the media, was seen as the greatest promoter of energy conservation. This result further emphasizes the importance of a conservation-oriented educational program.

Several variables were viewed as having negative effects on conservation. The lack of information about cost and consumption was seen as having one of the greatest inhibiting effects. This finding indicates that residents thought it was important not only to know what to do, but also to receive feedback concerning how well they were doing. In

addition, one-fifth of the respondents saw the furnishing of utilities as having a negative effect on conservation. It could be speculated that this figure is too low. Although the furnishing of utilities removes the monetary incentive for conserving, residents may have been careful not to take a strong stand against furnished utilities for fear of losing the privilege.

The energy efficiency of furnished appliances was also seen as being a hindrance to conservation. If, in reality, the appliances are of an energy-efficient nature, this fact should be presented during the educational program. If the furnished appliances are detrimental to conservation, this should be considered in future purchases. Whatever the case, consistency between the appeals to residents to conserve and other Navy practices is essential.

Another inhibiting effect dealt with the opinions of other residents. An important emphasis of an energy conservation program should be the development of a conservation-oriented norm that would make wasteful consumption socially unacceptable. If this were the case, the opinions of other residents would be largely supportive of conservation.

The final and most significant hindrance to conservation was the quality of housing construction. Over half of the residents considered the construction of their present housing to be a hindrance to energy conservation. This finding was consistent with residents' responses to items in the Housing Problems section of the questionnaire, which concerned specific housing problems that respondents believed to result in wasting energy. On each of these items, a large proportion of residents reported problems associated with their housing. Residents' perceptions of the quality of their housing can greatly affect the success of a conservation program. Thus, if such a program were conducted, residents would likely become sensitized to the structural constraints on their conservation efforts and feel that their striving toward conservation goals should be supported by housing office maintenance.

As these results indicate, residents frequently believed that the structure and maintenance of their housing were hindrances to their energy-conservation efforts. Thus, before a conservation program can be truly effective, gaining the widespread acceptance and support of housing residents, attempts at correcting such problems should be clearly demonstrated. Effort can be made to inform residents of the energy-efficient aspects of their housing and any subsequent energy-related modifications should be used to demonstrate to residents that the Navy is working with them to reduce consumption.

No specific household category stood out as a primary problem area. Of the more significant nonconserving practices, many are related to personal and family comfort, such as failing to follow appropriate thermostat guidelines for space or water heating. The differentiation between one-time or infrequent practices and regular or frequent practices indicates two major thrusts possible in any educational program. One-time practices require motivating some specific action, while frequent practices require associating a heightened energy consciousness with corresponding practices. The latter require constant reminders and encouragement until they eventually become internally supported.

CONCLUSIONS

Several energy-related attitudes were found to be inconsistent with energy conservation. Among these attitudes were those related to personal impact, personal comfort, and the reality of the energy shortage.

The system variables having the greatest inhibiting effects on conservation included the construction and maintenance of housing and the lack of information concerning cost and consumption. System variables seen as having the greatest positive effects on conservation were those related to information and experience (i.e., information through the media, civilian housing experience, and housing office programs).

With respect to household energy-related practices, no one category stood out as a primary problem area. However, the greatest inhibiting effects are found in practices related to personal and family comfort.

From these results, it is apparent that an energy conservation program would best be of an educational nature, emphasizing development of proconservation attitudes and providing information regarding energy-efficient practices, utility consumption, and costs. Structural maintenance and modifications could be related to such educational efforts, demonstrating the Navy's comprehensive concern for conservation and its willingness to support the residents in their effort to reduce energy consumption.

RECOMMENDATIONS

1. Frequently repeated conservation practices should be treated differently than one-time conservation actions in any educational program. Repetitious practices should be maintained by continuing external supports until they become self-sustaining through internal supports.

2. To increase energy conservation practices, Navy management policies should include:

- a. Implementing a comprehensive educational program directed toward energy conservation.

- b. Providing residents with feedback concerning utility consumption and costs.

- c. Making energy-conserving structural modifications to residences.

- d. Providing rapid response to energy-related maintenance requests by residents.

REFERENCES

- Becker, L. J. Joint effect of feedback and goal setting on performance: A field study of residential energy conservation. Journal of Applied Psychology, 1978, 63, 428-433.
- Darley, J., Seligman, C., & Becker, L. J. The lesson of Twin Rivers: Feedback works. Psychology Today, 1979, April, 16-24.
- Feher, B., Little, D. F., & Somer, E. P. Energy conservation in Navy family housing: A "master-metered" approach (NPRDC TR 82-18). San Diego: Navy Personnel Research and Development Center, November 1981.
- Nie, N. H., Hull, C. H., Jenkins, J. G., Steinbrenner, K., & Bent, D. H. SPSS: Statistical package for the social sciences (Second Ed.). New York: McGraw-Hill, 1975.
- Seligman, C., Kriss, M., Darley, J. M., Fazio, R. H., Becker, L. J., & Pryor, J. B. Predicting summer energy consumption from homeowners' attitudes. Journal of Applied Social Psychology, 1979, 9, 70-90.
- Socolow, R. H. The Twin Rivers program on energy conservation in housing: Highlights and conclusions (Rep No. 51). Princeton, NJ: Center for Environmental Studies, Princeton University, August 1978.
- Stern, P. C., & Kirkpatrick, E. M. Energy behavior, Environment, 1977, 10, 10-15.
- Yergin, D. Conservation: The key energy source. In E. Strobaugh and D. Yergin (Eds.). Energy future: Report of the energy project at the Harvard Business School. New York: Random House, 1979.
- White, M., Magnusson, P., & Somer, E. P. Energy conservation attitudes and behaviors of Navy family housing residents (NPRDC Spec. Rep. 79-23). San Diego: Navy Personnel Research and Development Center, July 1979.

PRECEDING PAGE BLANK-NOT FILMED

APPENDIX A
SURVEY QUESTIONNAIRE



DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
200 STOVALL STREET
ALEXANDRIA, VA 22332

IN REPLY REFER TO:

Dear Family Housing Resident:

Your household was contacted recently to participate in an experiment concerned with the conservation of energy in military housing. This study is sponsored by the Navy Facilities Engineering Command and jointly conducted by Science Applications, Inc. and the Navy Personnel Research and Development Center, San Diego.

The purpose of the enclosed questionnaire is to obtain information about your attitudes and behaviors concerning energy conservation, your attitudes about your housing, and some information concerning your appliances. This information will be useful in evaluating the results of the experiment in which you are involved.

Your individual responses will be confidential. They will be combined with the responses of many other participants. You are asked to provide your name and social security number for data handling purposes only. Therefore, please be frank in answering these questions.

If at any time you have questions concerning this portion of the study write to the address below.

Commanding Officer
Navy Personnel Research and Development Center (Code P307, EPS)
San Diego, California 92152

You are requested to complete the attached questionnaire within three (3) days and return it promptly in the enclosed envelope.

Your helpfulness is greatly appreciated.

Sincerely,

DORWIN B. WILE
Capt., CEC, USN
Assistant Commander for
Family Housing

Encl:

- (1) Return envelope
- (2) Questionnaire

RESIDENTIAL ENERGY CONSERVATION SURVEY

Protection of Individual Privacy

Under the authority of 5USC301, as reflected in OPNAV 5450 of 17 April 1975, information is requested regarding your personal opinions and attitudes about energy conservation. The information will be used for statistical purposes only. In no case will an individual's response be used in making decisions affecting him personally. You are not required to provide this information; your participation is voluntary.

INSTRUCTIONS

1. This questionnaire consists of multiple-choice questions. Please respond to these questions by circling the number of your choice on the questionnaire.
2. Please be sure to include your name and social security number in the spaces provided.
3. Use any pencil or pen, the darker the better.
4. Erase cleanly or "X" over any answer you wish to change.
5. After completing the questionnaire, please mail it to NPRDC using the pre-addressed stamped return envelope provided.

THANK YOU FOR YOUR COOPERATION.

NAME: _____ SOCIAL SECURITY NO. _____ - _____ - _____ (1-9)

YOURSELF AND YOUR FAMILY

Some of these questions refer to your family's service member; if there is more than one service member in your family please answer the questions about the one under whose name your housing is assigned.

1. The person filling out this questionnaire is:

- 1. The family's service member
- 2. The service member's spouse (10)
- 3. Child
- 4. Other

2. What is the service member's sex?

- 1. Male (11)
- 2. Female

3. What is the highest educational level of the service member?

- 1. Elementary school
- 2. Some high school
- 3. High school graduate or equivalent (12)
- 4. Some college
- 5. Bachelor's degree
- 6. Some graduate work or advanced degree

4. What is the age of the service member?

- 1. Under 18
- 2. 18-25 years (13)
- 3. 26-30 years
- 4. 31-40 years
- 5. 41-50 years
- 6. Over 50 years

5. What is the pay grade of the service member?

- | | | |
|-------|-------|---------------|
| A. E1 | J. W1 | N. 01 |
| B. E2 | K. W2 | O. 02 |
| C. E3 | L. W3 | P. 03 |
| D. E4 | M. W4 | Q. 04 |
| E. E5 | | R. 05 |
| F. E6 | | S. 06 |
| G. E7 | | T. 07 or over |
| H. E8 | | |
| I. E9 | | |
- (14)

6. What is the age of the service member's spouse?

- 0. Not applicable--no spouse
- 1. Under 18
- 2. 18-25 years
- 3. 26-30 years (15)
- 4. 31-40 years
- 5. 41-50 years
- 6. Over 50 years

7. What is the highest educational level of the service member's spouse?

1. Elementary school
2. Some high school
3. High school graduate or equivalent
4. Some college
5. Bachelor's degree
6. Some graduate work or advanced degree

(16)

If either the service member or the service member's spouse is filling out this questionnaire, skip to item 11.

If the person filling out this questionnaire is neither the service member nor the service member's spouse, please answer items 8-10 about yourself.

8. What is your sex?

1. Male
2. Female

(17)

9. What is your age?

1. 12 years or under
2. 13-17 years
3. 18-25 years
4. 26-30 years
5. 31-40 years
6. 41-50 years
7. Over 50 years

(18)

10. What is your highest educational level?

1. Elementary school
2. Some high school
3. High school graduate or equivalent
4. Some college
5. Bachelor's degree
6. Some graduate work or advanced degree

(19)

11. How long have you lived in your present residence?

- | | |
|-----------------|-------------------|
| 1. 0-2 months | 6. 16-18 months |
| 2. 3-6 months | 7. 19-21 months |
| 3. 7-9 months | 8. 22-24 months |
| 4. 10-12 months | 9. Over 24 months |
| 5. 13-15 months | |

(20)

12. How many people live in your home (include yourself and all those you expect to live with you at least 6 months)?

- | | |
|-----------|--------------|
| 1. 1 only | 6. 6 |
| 2. 2 | 7. 7 |
| 3. 3 | 8. 8 |
| 4. 4 | 9. 9 or more |
| 5. 5 | |

(21)

20. Circle the number of the statement that best describes your overall satisfaction with your present Navy housing.

1. Very dissatisfied
2. Somewhat dissatisfied
3. Neither satisfied nor dissatisfied
4. Somewhat satisfied
5. Very satisfied
6. No opinion

(29)

21. Is there a single person in your family who accounts for most of the energy conservation in your home?

1. No, energy conservation is really not a part of our activities.
2. No, energy conservation is practiced by almost everyone in our family.
3. Yes, it is the family's service member.
4. Yes, it is the spouse of the service member.
5. Yes, it is a child member of the family.
6. Yes, other (specify: _____).

(30)

22. When it comes to making choices and decisions in your family about a car, an appliance, a place of residence, etc., generally:

1. One person gathers the facts and decides what is best, taking into consideration the family's needs.
2. Husband and wife (or other adults) discuss it and jointly decide.
3. We all (adolescent and adult) give our opinions for consideration by the decision maker, who chooses what seems best.
4. We all (adolescent and adult) vote or give our preference, but several family members have greater weight than the rest.
5. We all (adolescent and adult) vote and the choice of the majority is adopted.
6. We all (adolescent and adult) discuss the options until a consensus is reached as to the best choice.

(31)

13. How many of the people you counted in #12 are 5 years old or less?

- | | |
|------|--------------|
| 0. 0 | 5. 5 |
| 1. 1 | 6. 6 |
| 2. 2 | 7. 7 |
| 3. 3 | 8. 8 or more |
| 4. 4 | |

(22)

14. How many of the people you counted in #12 are 6-12 years old?

- | | |
|------|--------------|
| 0. 0 | 5. 5 |
| 1. 1 | 6. 6 |
| 2. 2 | 7. 7 |
| 3. 3 | 8. 8 or more |
| 4. 4 | |

(23)

15. How many of the people you counted in #12 are 13-18 years old?

- | | |
|------|--------------|
| 0. 0 | 5. 5 |
| 1. 1 | 6. 6 |
| 2. 2 | 7. 7 |
| 3. 3 | 8. 8 or more |
| 4. 4 | |

(24)

16. How many days during an average week does a member of your family stay at home for most of the day?

- | | |
|------|------|
| 0. 0 | 5. 5 |
| 1. 1 | 6. 6 |
| 2. 2 | 7. 7 |
| 3. 3 | |
| 4. 4 | |

(25)

17. Circle the number of the statement that best describes your present life-style.

1. Can afford some luxuries
2. Can afford few luxuries
3. Comfortable; can afford everything we need
4. Have to budget carefully just to get by
5. Can't afford some of the things we need

(26)

18. Circle the number of the statement that best describes the lifestyle in your home when you were growing up.

1. Could afford some luxuries
2. Could afford few luxuries
3. Comfortable; could afford everything we needed
4. Had to budget carefully just to get by
5. Couldn't afford some of the things we needed

(27)

19. What would you estimate your total family income to be? (In your estimate include all service member's cash allowances, e.g., comrats, uniform allowance, and any income from spouse's employment.)

- | | |
|-------------------------------|-------------------------------|
| 1. Less than \$6,000 per year | 6. \$16,000-\$19,999 per year |
| 2. \$6,000-\$7,999 per year | 7. \$20,000-\$24,999 per year |
| 3. \$8,000-\$9,999 per year | 8. \$25,000-\$30,000 per year |
| 4. \$10,000-\$12,999 per year | 9. Over \$30,000 per year |
| 5. \$13,000-\$15,999 per year | |

(28)

GENERAL ENERGY ATTITUDES

Many of the following items appear similar, but they are slightly different in each case. Please circle the number in front of each statement which best describes how you feel about that statement, using the following scale:

1. Strongly agree
2. Somewhat agree
3. Neither agree nor disagree
4. Somewhat disagree
5. Strongly disagree
6. No opinion

- | | | | | | | | | |
|---|---|---|---|---|---|-----|--|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 23. | If people knew more about the energy situation they would conserve more. | (32) |
| 1 | 2 | 3 | 4 | 5 | 6 | 24. | We should change our way of life in this country so that we can live with the present energy situation. | (33) |
| 1 | 2 | 3 | 4 | 5 | 6 | 25. | I would be willing to pay for part of my utilities rather than reduce my energy consumption. | (34) |
| 1 | 2 | 3 | 4 | 5 | 6 | 26. | Regardless of the cause we are facing a long-term energy shortage. | (35) |
| 1 | 2 | 3 | 4 | 5 | 6 | 27. | The amount of energy a residential consumer could save isn't worth the effort and discomfort required to save it. | (36) |
| 1 | 2 | 3 | 4 | 5 | 6 | 28. | Wasteful use of energy in the home is to a large extent responsible for the present energy situation. | (37) |
| 1 | 2 | 3 | 4 | 5 | 6 | 29. | I would reduce my energy consumption rather than have to pay for it. | (38) |
| 1 | 2 | 3 | 4 | 5 | 6 | 30. | In my family, I think we generally try to conserve energy. | (39) |
| 1 | 2 | 3 | 4 | 5 | 6 | 31. | Depending too much on oil as an energy source has caused the present energy situation. | (40) |
| 1 | 2 | 3 | 4 | 5 | 6 | 32. | The present energy situation could be eased through energy conservation in the home. | (41) |
| 1 | 2 | 3 | 4 | 5 | 6 | 33. | I would not reduce my heating thermostat below the setting I find comfortable. | (42) |
| 1 | 2 | 3 | 4 | 5 | 6 | 34. | Foreign oil prices and restrictions are largely responsible for the present energy situation. | (43) |
| 1 | 2 | 3 | 4 | 5 | 6 | 35. | People should put on sweaters to stay warm before they raise their heater thermostat settings. | (44) |
| 1 | 2 | 3 | 4 | 5 | 6 | 36. | I would be willing to pay for any excess energy I use only if I were paid for the energy that I conserve on other occasions. | (45) |
| 1 | 2 | 3 | 4 | 5 | 6 | 37. | I think of myself as an energy conserver. | (46) |
| 1 | 2 | 3 | 4 | 5 | 6 | 38. | I would be willing to reduce my energy consumption only if it cost me something not to. | (47) |
| 1 | 2 | 3 | 4 | 5 | 6 | 39. | There would be enough energy if everyone quit wasting it. | (48) |
| 1 | 2 | 3 | 4 | 5 | 6 | 40. | Profiteering by oil and electric companies is largely responsible for the present energy situation. | (49) |

1. Strongly agree
2. Somewhat agree
3. Neither agree nor disagree
4. Somewhat disagree
5. Strongly disagree
6. No opinion

- | | | | | | | | | |
|---|---|---|---|---|---|-----|--|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 41. | There is no real shortage of energy. | (50) |
| 1 | 2 | 3 | 4 | 5 | 6 | 42. | I would conserve energy regardless of whether I had to pay for it or not. | (51) |
| 1 | 2 | 3 | 4 | 5 | 6 | 43. | Technological discoveries will provide all the energy we need long before our present sources run out. | (52) |
| 1 | 2 | 3 | 4 | 5 | 6 | 44. | We will have sufficient energy if we develop and adopt more energy efficient devices and appliances. | (53) |
| 1 | 2 | 3 | 4 | 5 | 6 | 45. | My own personal comfort is worth more to me than saving heating fuel or electricity. | (54) |
| 1 | 2 | 3 | 4 | 5 | 6 | 46. | I think I am well informed about household energy conservation. | (55) |

PERSONAL AND FAMILY CHARACTERISTICS

Please show how much you agree or disagree with the following statements, using the scale below:

1. Strongly agree
2. Somewhat agree
3. Neither agree nor disagree
4. Somewhat disagree
5. Strongly disagree
6. No opinion

- | | | | | | | | | |
|---|---|---|---|---|---|-----|--|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 47. | Regardless of how much money I have, I always shop around in order to get the best buy I possibly can. | (56) |
| 1 | 2 | 3 | 4 | 5 | 6 | 48. | If I buy something I always make use of it. | (57) |
| 1 | 2 | 3 | 4 | 5 | 6 | 49. | When buying an appliance, usually I am more concerned about its features and appearance than its technical specifications. | (58) |
| 1 | 2 | 3 | 4 | 5 | 6 | 50. | I often keep things of no immediate usefulness because I might have use for them later. | (59) |
| 1 | 2 | 3 | 4 | 5 | 6 | 51. | If it is something I want, I often will buy it even though I know that the price is too high. | (60) |
| 1 | 2 | 3 | 4 | 5 | 6 | 52. | Even though I am able to do something myself, I often pay to have it done for me. | (61) |
| 1 | 2 | 3 | 4 | 5 | 6 | 53. | I try to do any job as efficiently and economically as possible, whether or not I will benefit economically. | (62) |
| 1 | 2 | 3 | 4 | 5 | 6 | 54. | When I buy something (camera, kitchen appliances, major appliances, TV, etc.), my choice is usually the one that gives me the best quality for the money rather than the cheapest, best looking, or easiest to obtain. | (63) |

HOUSING PROBLEMS

The following statements are about problems your present housing may have which would waste energy. Please respond using the following scale:

0. Not present in your housing
1. Present in your housing

- | | | | |
|---|---|---|------|
| 0 | 1 | 55. Heating thermostats that are not adjustable. | (64) |
| 0 | 1 | 56. Windows or doors that do not close tightly. | (65) |
| 0 | 1 | 57. Poorly placed heating vents. | (66) |
| 0 | 1 | 58. Cracks in floors, walls, ceilings, etc. | (67) |
| 0 | 1 | 59. Refrigerator or oven doors that do not have a tight seal. | (68) |
| 0 | 1 | 60. Poorly placed heater thermostats. | (69) |
| 0 | 1 | 61. Hot water faucets that drip. | (70) |
| 0 | 1 | 62. Drapes, shades or curtains missing. | (71) |
| 0 | 1 | 63. Cracked or broken windows. | (72) |
| 0 | 1 | 64. Inadequate insulation in housing. | (73) |
| 0 | 1 | 65. Other (Specify _____). | (74) |

ENERGY CONSERVATION FACTORS

Please show how the following factors affect energy conservation behavior in Navy family housing, using the scale below:

1. Promotes conservation
2. No effect
3. Hinders conservation
4. Don't know

- | | | | | | |
|---|---|---|---|--|------|
| 1 | 2 | 3 | 4 | 66. General opinions of other Navy housing residents about energy conservation. | (75) |
| 1 | 2 | 3 | 4 | 67. Past experiences in civilian housing. | (76) |
| 1 | 2 | 3 | 4 | 68. General energy conservation information presented through the media (TV, newspaper, etc.). | (77) |
| 1 | 2 | 3 | 4 | 69. Lack of information about cost and amount of energy used in your housing. | (78) |
| 1 | 2 | 3 | 4 | 70. Energy conservation information programs initiated by the Navy family housing office. | (79) |
| 1 | 2 | 3 | 4 | 71. The energy efficiency of the furnished appliances in your housing. | (10) |
| 1 | 2 | 3 | 4 | 72. The construction of your housing. | (11) |
| 1 | 2 | 3 | 4 | 73. Having utilities furnished in Navy family housing. | (12) |
| 1 | 2 | 3 | 4 | 74. Other (Specify _____). | (13) |

ENERGY CRISIS ACTION ALTERNATIVES

If another energy crisis occurred, longer in duration and greater in severity than the one in 1973, which of the following actions do you think would be justified? Respond using the scale below:

1. Completely justified
 2. Somewhat justified
 3. Undecided
 4. Somewhat unjustified
 5. Completely unjustified
 6. No opinion
-

- | | | | | | | | |
|---|---|---|---|---|---|--|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 75. Set up a severe gasoline tax for those who drive large gasoline wasting cars. | (14) |
| 1 | 2 | 3 | 4 | 5 | 6 | 76. Set up a gasoline rationing program based entirely on each individual's basic needs. | (15) |
| 1 | 2 | 3 | 4 | 5 | 6 | 77. Set up gasoline rationing where people would have to pay a much higher price for gasoline bought over their minimum allotment. | (16) |
| 1 | 2 | 3 | 4 | 5 | 6 | 78. Continue present actions without any changes. | (17) |
| 1 | 2 | 3 | 4 | 5 | 6 | 79. Reduce the maximum speed limit to lower than 55 mph. | (18) |
| 1 | 2 | 3 | 4 | 5 | 6 | 80. Reduce pollution control standards so that cars could get better mileage. | (19) |
| 1 | 2 | 3 | 4 | 5 | 6 | 81. Develop convenient mass transit systems to reduce driving. | (20) |
| 1 | 2 | 3 | 4 | 5 | 6 | 82. Set up gasoline rationing where everyone would be allowed the same amount regardless of need. | (21) |
| 1 | 2 | 3 | 4 | 5 | 6 | 83. Raise the tax on gasoline in order to reduce consumption. | (22) |
| 1 | 2 | 3 | 4 | 5 | 6 | 84. Give cheaper rates for gasoline to carpoolers. | (23) |
| 1 | 2 | 3 | 4 | 5 | 6 | 85. Require people to carpool to work. | (24) |
| 1 | 2 | 3 | 4 | 5 | 6 | 86. Eliminate from the market cars that get too few miles to the gallon. | (25) |

ENERGY CONSUMPTION PRACTICES

Using the scale below, please show how often the following activities occur in your home:

- 0. Never
- 1. Some of the time
- 2. Half of the time
- 3. Most of the time
- 4. All of the time
- 5. Does not apply

- | | | | | | | | |
|---|---|---|---|---|---|---|------|
| 0 | 1 | 2 | 3 | 4 | 5 | 87. Wash partially full loads of laundry. | (26) |
| 0 | 1 | 2 | 3 | 4 | 5 | 88. Have lights on with no one in the room. | (27) |
| 0 | 1 | 2 | 3 | 4 | 5 | 89. Keep your heater thermostat at 68 degrees F or lower. | (28) |
| 0 | 1 | 2 | 3 | 4 | 5 | 90. Heat small items such as sandwiches in oven or broiler. | (29) |
| 0 | 1 | 2 | 3 | 4 | 5 | 91. Turn off heating vents in rooms not being used. | (30) |
| 0 | 1 | 2 | 3 | 4 | 5 | 92. Turn heating down or off when no one is home. | (31) |
| 0 | 1 | 2 | 3 | 4 | 5 | 93. Remind family members to conserve energy. | (32) |
| 0 | 1 | 2 | 3 | 4 | 5 | 94. Shower or bathe in cooler water than you used to. | (33) |
| 0 | 1 | 2 | 3 | 4 | 5 | 95. Take short showers (5 minutes or less). | (34) |
| 0 | 1 | 2 | 3 | 4 | 5 | 96. Plan ahead to get all needed items out of refrigerator at one time. | (35) |
| 0 | 1 | 2 | 3 | 4 | 5 | 97. Turn down heater thermostat before going to bed at night. | (36) |
| 0 | 1 | 2 | 3 | 4 | 5 | 98. Pre-heat your oven for foods such as roasts, casseroles, etc. | (37) |
| 0 | 1 | 2 | 3 | 4 | 5 | 99. Run hot water to wash or rinse dishes instead of filling the sink. | (38) |
| 0 | 1 | 2 | 3 | 4 | 5 | 100. Reduce the number of lights burning at the same time. | (39) |
| 0 | 1 | 2 | 3 | 4 | 5 | 101. Use clothes dryer with less than full loads. | (40) |
| 0 | 1 | 2 | 3 | 4 | 5 | 102. Wash clothes in cold water. | (41) |
| 0 | 1 | 2 | 3 | 4 | 5 | 103. Close draperies or shades when it is very cold. | (42) |
| 0 | 1 | 2 | 3 | 4 | 5 | 104. Hang clothes outside to dry when possible. | (43) |

Which of the following actions has your family performed? Use the following scale:

- 0. Actions your family has not performed
- 1. Actions your family has performed
- 2. Actions that do not apply to your family or your housing

- | | | | | |
|---|---|---|---|------|
| 0 | 1 | 2 | 105. Decreased the temperature setting of your water heater. | (44) |
| 0 | 1 | 2 | 106. Set the temperature slightly warmer in your refrigerator. | (45) |
| 0 | 1 | 2 | 107. Installed window or door weather stripping or some other form of insulation in your housing. | (46) |
| 0 | 1 | 2 | 108. Replaced light bulbs with ones lower in wattage than you used to use. | (47) |

HOUSEHOLD INVENTORY

Please provide the following information about the appliances in your residence.

109. What type of television do you own?
- 0. Do not own a television
 - 1. One black and white only (48)
 - 2. One color television only
 - 3. Color only, but more than one
 - 4. Black and white only, but more than one
 - 5. One or more of each type (color and B&W)
110. Do you own a microwave oven?
- 0. No (49)
 - 1. Yes, without a browning element
 - 2. Yes, with a browning element
111. How many refrigerators do you use in your home?
- 1. 1
 - 2. 2
 - 3. 3 or more (50)
112. In addition to your refrigerator, do you have a separate food freezer?
- 0. No (51)
 - 1. Yes, an upright type
 - 2. Yes, a chest type
113. Do you use a dishwasher?
- 0. No (52)
 - 1. Yes
114. Do you use a washing machine in your residence?
- 0. No (53)
 - 1. Yes
115. Do you use a clothes dryer in your residence?
- 0. No (54)
 - 1. Yes, electric
 - 2. Yes, gas
116. Do you use portable electric heaters in your housing?
- 0. No (55)
 - 1. Yes (one only)
 - 2. Yes (two)
 - 3. Yes (three or more)

THANKS AGAIN. PLEASE RETURN YOUR QUESTIONNAIRE IN THE ENCLOSED POSTAGE-PAID ENVELOPE.

APPENDIX B
RESPONSE DATA TO
QUESTIONNAIRE SECTIONS NOT DISCUSSED

Table B-1
Percent Distribution of Responses to
Items Concerning Personal and
Family Characteristics

ITEM	Percentage		
	Disagree	Neither Agree nor disagree/ no opinion	Agree
47. Regardless of how much money I have, I always shop around in order to get the best buy I possibly can.	5.4	3.4	91.1
48. If I buy something I always make use of it.	5.6	5.6	88.7
49. When buying an appliance, usually I am more concerned about its features and appearance than its technical specifications.	60.9	12.8	26.3
50. I often keep things of no immediate usefulness because I might have use for them later.	13.8	7.9	78.4
51. If it is something I want, I often will buy it even though I know that the price is too high.	71.0	8.9	20.1
52. Even though I am able to do something myself, I often pay to have it done for me.	84.0	5.7	10.2
53. I try to do any job as efficiently and economically as possible, whether or not I will benefit economically.	5.7	13.3	81.0
54. When I buy something (camera, kitchen appliances, major appliances, TV, etc.), my choice is usually the one that gives me the best quality for the money rather than the cheapest, best looking or easiest to obtain.	3.7	3.8	92.4

Table B-2
Percent Distribution of Responses to
Items Concerning Energy Crisis
Action Alternatives

Item	Unjustified	Percentage	
		Undecided/ No Opinion	Justified
75. Set up a severe gasoline tax for those who drive large gasoline wasting cars.	44.1	12.5	43.3
76. Set up a gasoline rationing program based entirely on each individual's basic needs.	54.2	13.2	32.6
77. Set up gasoline rationing where people would have to pay a much higher price for gasoline bought over their minimum allotment.	50.7	14.8	34.5
78. Continue present actions without any changes.	15.7	36.5	47.8
79. Reduce the maximum speed limit to lower than 55 mph.	8.9	13.9	77.1
80. Reduce pollution control standards so that cars could get better mileage.	50.1	18.1	31.7
81. Develop convenient mass transit systems to reduce driving.	79.5	14.2	6.4
82. Set up gasoline rationing where everyone would be allowed the same amount regardless of need.	16.9	13.1	70.1
83. Raise the tax on gasoline in order to reduce consumption.	14.3	11.7	74.0
84. Give cheaper rates for gasoline to carpoolers.	53.3	18.3	28.4
85. Require people to carpool to work.	30.7	15.4	53.9
86. Eliminate from the market cars that get too few miles to the gallon.	61.6	13.4	25.0

Percent Distribution of Responses
to Household Inventory Items

ITEM	Percent of Families Owning Each Appliance
109. What type of television do you own?	
Do not own a television	.9
One black and white only	7.3
One color television only	39.1
Color only, but more than one	11.0
Black and white only, but more than one	1.4
One or more of each type (color and B&W)	40.3
110. Do you own a microwave oven?	
No	83.4
Yes, without a browning element	14.3
Yes, with a browning element	2.2
111. How many refrigerators do you use in your home?	
1	72.8
2	26.8
3 or more	.4
112. In addition to your refrigerator, do you have a separate food freezer?	
No	52.9
Yes, an upright type	35.0
Yes, a chest type	11.9
113. Do you use a dishwasher?	
No	56.4
Yes	43.0
114. Do you use a washing machine in your residence?	
No	3.3
Yes	96.6
115. Do you use a clothes dryer in your residence?	
No	6.1
Yes, electric	86.5
Yes, gas	7.3
116. Do you use portable electric heaters in your housing?	
No	96.2
Yes (one only)	3.3
Yes (two)	.4
Yes (three or more)	.1

DISTRIBUTION LIST

Director of Manpower Analysis (ODASN(M))
Director, Defense Audit Service (System and Logistics Audits)
Chief of Naval Operations (OP-01), (OP-11), (OP-12) (2), (OP-115) (2), (OP-140F2), (OP-413), (OP-987H)
Chief of Naval Material (NMAT 04), (NMAT 08L)
Chief of Naval Research (Code 200), (Code 440) (3), (Code 442), (Code 448)
Chief of Information (OI-213)
Commander Naval Facilities Engineering Command (Code 08A) (10)
Commander Naval Supply Systems Command
Commander Naval Military Personnel Command (NMPC-013C)
Commander, Pacific Missile Test Center (Housing Director)
Commanding Officer, Naval Air Station, Fallon (Housing Director)
Commanding Officer, Naval Construction Battalion Center, Port Hueneme (Housing Director)
Commanding Officer, Navy Public Works Center, Great Lakes (Housing Director)
Director, Naval Civilian Personnel Command
Commander, Army Research Institute for the Behavioral and Social Sciences, Alexandria (PERI-ASL)
Chief, Army Research Institute Field Unit, Fort Harrison
Commander, Air Force Human Resources Laboratory, Brooks Air Force Base (Scientific and Technical Information Office)
Commander, Air Force Human Resources Laboratory, Williams Air Force Base (AFHRL/OT)
Commander, Air Force Human Resources Laboratory, Wright-Patterson Air Force Base (AFHRL/LR)
Director, Plans and Programs, Air Force Logistic Management Center, Gunter Air Force Station
Superintendent, U.S. Coast Guard Academy
Secretary, Department of Energy (Conservation and Solar Energy)
Defense Technical Information Center (DDA) (12)

**DATE
FILMED**

2-8